THE SUBSPECIES OF THE FIG PARROT, *OPOPSITTA DIOPHTHALMA*

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SUMMARY

The Fig Parrot (*Opopsitta diophthalma* Hombron and Jacquinot) occurs in New Guinea and the adjacent islands and north-eastern Australia as far south as northern New South Wales. In this revision nine subspecies have been recognized following examinations of specimens of all of the described races. The subspecies *O. d. festetichi* and *O. d. coccineifrons* have been provisionally accepted pending the acquisition of more material, but *O. d. howeri* and *O. d. tweedi* have been dismissed. The recognition of *O. coxeni* as a distinct species has been rejected.

The Fig Parrot, *Opopsitta diophthalma* (Hombron and Jacquinot), is a polytypic species widely distributed throughout the New Guinea area and along the coast of north-eastern Australia as far south as northern New South Wales. A number of subspecies have been described from various parts of its range. The aim of the work reported in this paper was the determination of the status of these subspecies.

In 1964, with assistance from the Frank M. Chapman Memorial Fund, the author visited New York and examined the specimens of *Opopsitta diophthalma* in the collections of the American Museum of Natural History (AMNH). Upon returning to Australia, he examined the skins in the Australian Museum (AM), Sydney and the National Museum of Victoria which also houses the H. L. White Collection (HLW). Specimens from the Queensland Museum (QM) were forwarded on loan.

It was found that pests had caused such severe damage to the type material of *O. d. marshalli* that it was useless for determining the status of the race. As no other material had been collected, the author, under a further grant from the Frank M. Chapman Memorial Fund, led an expedition to Iron Range, Cape York Peninsula in January 1966 for the purpose of collecting new material near the type locality of *marshalli*. An examination of the six specimens collected made it clear that *marshalli* was a valid race. Consequently (Forshaw, 1966) a submission was placed before the International Commission of Zoological Nomenclature requesting that the holotype of *O. d. marshalli* be set aside and one of the recently collected specimens (QM. O.10691) be designated the neotype.

Skins that were unsexed or had inadequate locality data were not used. All differences in plumage were noted, but wing measurements were taken only from adult specimens.

SPECIMENS EXAMINED:—Four males, three females, Misol: one female, one imm. male, Kafau, West Irian: one imm. male, Kapaur, West Irian: one male, one female, north-west New Guinea (=West Irian): two males, Waigeu Island: two males, one female, two imm. males, one imm. female, Kubor Range, New Guinea: one male, Miku Bay, N.G.: one male, Sinibang, N.G.: one male, Ramu River, N.G.: one male, Holnicote Bay, N.G.: one female, Kamusi R., N.G.: one male, Brown R., N.G.: one male, one female, Angabunga R., N.G.: three males, two females, Upper Aroa R., N.G.: five males, three females, one imm. male, Aru Is.: one male, Fly R., N.G.: five males, four females, Fergusson I., N.G.: eight males, seven females, Sudest (=Tagula) I., N.G.: three males, three females, Iron Range, north Queensland: one male, Tolga, N.Q.: two males, one female, Barron R., N.Q.: three males, one female, Cedar Bay, N.Q.: two females, Rockingham Bay, N.Q.: six males, three females, three imm. males, two imm. females, Cairns, N.Q.: three females, Lake Eacham, N.Q.: one male, five females, Cardwell, N.Q.: two females, Russell R., N.Q.: two females, Queensland: one female, Brisbane, Q.: four males, one female, Richmond R., New South Wales: two males, Tweed R., N.S.W.: one male, south-east Queensland.

SYSTEMATICS

Opopsitta diophthalma diophthalma (Hombron and Jacquinot)

Psittacula diophthalma Hombron and Jacquinot, 1841, Ann. Sci. nat., Zool. (2) **16**: 318. (southern coast of New Guinea = Triton Bay.)

RANGE: West Irian, including the western islands, and western New Guinea as far east as Astrolabe Bay in the north and Etna Bay in the south.

PLUMAGE: Some variation was evident in the specimens examined. Adult males had the forehead, crown, lores and cheeks varying from bright scarlet to deep red, and on the hind-crown there was a variable band of orange-yellow. On the lower cheeks under the red there was a band of mauve-blue and above and in front of the eye a patch of bright sky blue; the innermost wing-coverts were bright orange-red. Adult females and immatures had the lower cheeks buff-brown instead of red, and below the red line extending underneath the eye there were some pale blue feathers, which became more conspicuous towards the sides of the head.

Gyldenstolpe (1955) examined an adult female from the Vogelkop, West Irian, and reported that below the red line underneath the eye there was no blue colouration, this part being dusky white. Specimens from Misol Island and the north of West Irian examined in this study did possess the blue colouration.

SIZE: The wing length of seven males was 80·7 – 91·3 mm (86·6 mm.) and of five females was 80·5 – 85·7 mm (82·8 mm.).

Opopsitta diophthalma festetichi (Madarasz)

Cyclopsittacus festetichi Madarasz, 1902, Term-Tud. Füz. **25**: 350. (East coast of Bougainville, Solomon Islands, error = Astrolabe Bay, northern Territory of New Guinea.)

RANGE: The Astrolabe Bay area, New Guinea; limits unknown.

PLUMAGE: The original description of *festetichi* stated that it resembled *diophthalma,* but the green of the general body plumage was darker.

Peters (1937) and Mayr (1941) synonymized this race with *diophthalma,* but Gyldenstolpe (1955) advocated its acceptance and referred to it 10 specimens collected by him near Nondugl in the Wahgi Valley. He compared these specimens with a single female from the Vogelkop and found that they were easily distinguishable by their markedly darker green plumage. Furthermore, the females had darker red on their foreheads and the yellow bands on the crowns were more prominent and more orange-yellow in colour. Attention was also drawn to their possession of a blue line under the eye but, as reported above, this is also present in *diophthalma.*

Two males (CSIRO 2178 and 2306) and one female (CSIRO 2125) from the Kubor Range were examined and compared with two males (AMNH 618919 and 618929) and one female (AMNH 618913) of the nominate race. The green of the upper parts was darker in the Kubor birds, but there was virtually no difference in the colour of the underparts. In the males the orange-yellow bands on the crowns were definitely wider and more pronounced than in any of the typical birds, while in the female it was comparable with those of the typical males. Another conspicuous difference noted was that the innermost wing-coverts were a much darker and deeper red. All of these plumage differences were also present in three immature birds, but no immature *diophthalma* were available for direct comparison.

SIZE: The wing length of two males from the Kubor Range was 92·0 – 99·0 mm (95·5 mm) and for one female was 92·0 mm. These agree with 96·0 – 99·0 mm (97·6 mm) for three males and 93·0 – 98·0 mm (94·7 mm) for four females collected by Gyldenstolpe. The larger size, coupled with apparent plumage differences, supports the provisional retention of *festetichi* as advocated by Gyldenstolpe.

Opopsitta diophthalma coccineifrons (Sharpe)

Cyclopsittacus coccineifrons Sharpe, 1882, J. Linn. Soc. (Zool.) **16**: 318. (Astrolabe Mountains New Guinea.)

RANGE: South-eastern New Guinea.

PLUMAGE: The original description stated that this race was distinguished from *diophthalma* by having the front of the face, lores, and cheeks dull red not scarlet.

Rothschild and Hartert (1901) and Peters (1937) declared that *coccineifrons* was a doubtful race. Mathews (1927) accepted it, but Mayr (1941) placed it in synonymy with *diophthalma*. Ogilvie-Grant (1915) said that it was easily separable as a subspecies because in the male the red on the forehead and cheeks was "of a rather dull crimson-scarlet instead of bright scarlet" and the yellow band across the crown was distinctly wider.

In the specimens examined there was considerable variation in the red of the cheeks and forehead, but the wide yellow band on the crown was a constant character. The red on the innermost wing-coverts was darker than in the males of *diophthalma*.

The differences between this race and *festetichi* were not striking and one male (AMNH 618937) from the Huon Gulf area appeared to be intermediate in both plumage and size. The specimens of *coccineifrons* tended to show lighter green on both the upper and under surfaces and lighter, brighter red on the forehead, cheeks, and innermost wing-coverts. However, individual variation detracted from the consistency of these differences. It is possible that an examination of a larger series of specimens from eastern New Guinea may result in the synonymizing of *festetichi* with *coccineifrons*, but for the present it seems advisable to accept both races.

SIZE: The wing length for nine males was 82·8 – 92·1 mm (87·0 mm) and for four females was 82·3 – 88·3 mm (85·3 mm). Only two males (AMNH 618937 and 618947) exceeded 89·0 mm, the remainder being decidely smaller than the average for *festetichi*.

Opopsitta diophthalma aruensis (Schlegel)

Psittacula diophthalma aruensis Schlegel, 1874, Mus. Pays-Bas, 3, Psittaci revue, p. 33. (Aru Islands.)

RANGE: The Aru Islands and southern New Guinea between the Mimika and Fly Rivers.

PLUMAGE: A complete absence of red from the facial markings of adult females and immatures at once distinguishes this race. The forehead and crown are bright blue with buff-brown bases to the feathers becoming noticeably paler towards the lores and periophthalmic region; the lores and cheeks are buff-brown, bordered below by mauve-blue bands extending to and becoming paler on the chin. The adult male differs from the male of *coccineifrons* by having the blue patch above the eye more greenish in colour and restricted in extent, by having the mauve-blue bands under the cheeks continue through to the chin, and by having the yellow band on the crown very much reduced or even absent altogether. In the specimens examined the green of the upper surface in both sexes was noticeably lighter and more yellowish than in *coccineifrons*.

SIZE: The wing length for six males was 82·2 – 86·9 mm (84·9 mm) and for three females was 80·0 – 84·7 mm (81·6 mm).

Opopsitta diophthalma virago (Hartert)

Cyclopsittacus virago Hartert, 1895, Novit. Zool. **2**: 61. (Fergusson Island.)

RANGE: Fergusson and Goodenough Islands in the D'Entrecasteaux Group, New Guinea.

PLUMAGE: The adult male of *virago* is distinguished from that of *aruensis* by the absence of the blue patch from in front of and above the eye, by the replacement of the mauve-blue bands below the cheeks by a bright blue spot on either side of the neck, and by the paler red on the crown and face. The adult female has the periophthalmic region green instead of blue as in *aruensis*, has a well-defined bright red spot on the middle of the forehead, has the cheeks green with a few pale blue and buff markings, and lacks the mauve-blue bands under the cheeks. No immature specimens of this race were examined.

SIZE: The wing length for five males was 81·3 – 85·7 mm (83·8 mm) and for four females was 81·5 – 84·1 mm (83·0 mm). It was noted that the maximum lengths were in the types (AMNH 618961 ♂ and 618962 ♀).

Opopsitta diophthalma inseparabilis (Hartert)

Cyclopsittacus inseparabilis Hartert, 1898, Bull. Brit. orn. Cl. **8**: 9. (Sudest Island.)

RANGE: Tagula (= Sudest) Island in the Louisiade Archipelago, New Guinea.

PLUMAGE: This distinct insular subspecies (see Hartert, 1899, pl. 4) resembles the female of *virago* and is one of the two races characterized by the almost complete absence of sexual dimorphism. Both sexes have the entire head, except the forehead and forepart of the crown, bright green as on the underparts; the forehead is bright red bordered behind on the forepart of the crown by bright blue.

In the specimens examined the females appeared to have less red on the forehead, while in both sexes the green of the general body plumage was duller and slightly more yellowish than that of either *virago* or *aruensis*. No immature specimens were examined.

SIZE: The wing length for eight males was 78·5 – 88·8 mm (83·4 mm) and for seven females was 79·5 – 86·4 mm (84·2 mm).

Opopsitta diophthalma marshalli Iredale

Opopsitta marshalli Iredale, 1946, Emu **46**: 1, pl. 1. (Great Divide Range behind Lockhart River, Cape York Peninsula.)

RANGE: Cape York Peninsula, Queensland.

PLUMAGE: Direct comparisons between specimens of *marshalli*, the northernmost of the Australian subspecies, and *aruensis* showed that, although the two races were very similar, constant differences did exist. In the adult male the blue patch in front of the

eye was deeper and darker than in *aruensis* and had no greenish tinge. Variation in the intensity of the red colouration of the face was evident in the three males examined. The darkest red in *marshalli* (CSIRO 690) agreed with the palest in *aruensis* (AMNH 618951), while the palest in *marshalli* (CSIRO 692) approached the orange-red colouration found in the males of *virago*. There was also variation in the blue on the outer edges of the wing primaries, but in all specimens it appeared to be darker than in *aruensis*. The yellow band on the crown was conspicuous in one individual (CSIRO 692), present in another (CSIRO 690), and faintly indicated in the third (CSIRO 688). Variation in this characteristic was also found in *aruensis*, but in no specimen was it as prominent as in the first specimen of *marshalli* (CSIRO 692).

Comparison of adult females showed that in *marshalli* the feathers on the forepart of the crown were tipped with bright violet-blue as against pale sky blue in *aruensis*. One of the specimens examined (CSIRO 691) had two reddish feathers on either side of the upper mandible above the lores, similar markings to those shown in Iredale's drawing of the immature male. The females also showed the darker blue on the wing primaries. No immature specimens were collected.

Mayr (1947) compared Iredale's description and drawing of *marshalli* with a series of *aruensis* and declared that he could not find a single difference. He stated that absolute identity could not be established until the Cape York specimens were compared directly with specimens of *aruensis* but, until a valid distinction was found, *marshalli* would have to be considered a synonym of *aruensis*. Doubts have always existed concerning the status of this race and many authors have followed Mayr's decision. It must be pointed out that the colours of the heads in Iredale's drawing are not a true representation of the colours of *marshalli*, and indeed the blue on the crown of the female appears to be closer to that found in *aruensis*. Direct comparisons between the two races have brought out distinctions and shown *marshalli* to be a valid subspecies.

SIZE: The wing length for three males was 83·5 – 86·7 mm (84·5 mm) and for three females was 79·0 – 85·6 mm (82·7 mm).

Opopsitta diophthalma macleayana (Ramsay)

Cyclopsitta macleayana Ramsay, 1874, Sydney Morning Herald, 5 Nov., 1874. (Scrubs on the coast range, near Cardwell, Rockingham Bay, Queensland.)

Opopsitta diophthalma boweri Mathews, 1915, Aust. avian Rec. **2** (7): 127. (Barron River, North Queensland.)

RANGE: Coastal areas of northern Queensland.

PLUMAGE: The adult male of this race has only the centre of the forehead and the lower cheeks red, the remainder of the facial area being blue, darker on the sides of the forehead, paler and more greenish around the eyes. The adult females and immatures have the lower cheeks buff-brown with bluish markings.

In the specimens examined the mauve-blue bands below the cheeks were slightly narrower than in *aruensis*. Furthermore the green of the general body plumage of the females was duller and more yellowish than that of the males and resembled that of both sexes of *inseparabilis*.

In the original description of *O. d. boweri* Mathews stated that it differed from *leadbeateri* (= *macleayana*) by "being less conspicuously marked, the red on the face and forehead not so bright, the yellow on the sides of the body not so pronounced." Mathews (1927) later synonymized this race with *leadbeateri* (= *macleayana*), which he regarded as a separate species. Peters (1937) did likewise but retained *macleayana* as a subspecies of *O. diophthalma*.

As well as the type (AMNH 618990) of *boweri* another male (AMNH 618991) and a female (AMNH 618992) from the type locality were examined. Slight differences in the red on the face and forehead and the yellow on the flanks were not constant and were counterbalanced by the individual variation present in the specimens of *macleayana*. Therefore *boweri* must be synonymized with *macleayana*.

SIZE: The wing length for 13 males was 83·2 – 89·7 mm (86·7 mm) and for 17 females was 79·1 – 89·0 mm (85·3 mm). For *boweri* the wing length for two males was 86·9 – 87·7 mm (87·3 mm) and for one female was 87·0 mm; these measurements were within the range for *macleayana*.

Opopsitta diophthalma coxeni (Gould)

Cyclopsitta coxeni Gould, 1867, Proc. zool. Soc. Lond. **1867**: 182. (" . . . scrub on the east coast", i.e. near Brisbane, Queensland.)

Opopsitta coxeni tweedi Mathews, 1917, Aust. avian Rec. **3**: 128. (Tweed River, New South Wales.)

RANGE: The coastal regions of southern Queensland and northern New South Wales from Maryborough in the north to the Macleay River in the south.

PLUMAGE: A very distinct isolate, *coxeni* is the southernmost of all the races of *O. diophthalma* and is the second subspecies lacking notable sexual dimorphism. Both sexes have the crown green with a few blue feathers on the centre of the forehead; the cheeks are orange-red bordered below by a variable mauve-blue band.

In the specimens examined the adult males had some reddish feathers on the lores and surrounding the blue on the forehead. They also had slightly brighter and more extensive red cheeks and deeper blue primaries. The green of the general body plumage of both sexes was dull yellowish-green, similar to that of the females of *macleayana*.

Mathews did not give any distinguishing features for the race *tweedi*. In the original descritpion he merely stated that it was based on the specimen described and figured in his *Birds of Australia* (1917). Subsequently (1927) he synonymized it with *coxeni*, which was treated as a distinct species.

As well as the type (AMNH 618998) of *tweedi,* another male (HLW 199) from the Tweed River was examined, but no differences distinguishing them from *coxeni* could be found. This race must be synonymized with *coxeni.*

SIZE: The wing length for seven males was 92·8 – 96·6 mm (94·6 mm) and for four females was 92·2 – 93·7 mm (92·8 mm). The wing length for 2 males of *tweedi* was 95·0 – 96·2 mm (95·6 mm); this measurement was within the range for *coxeni.* These measurements showed that *coxeni* is decidely larger than the other Australian subspecies and approaches *festetichi* in size.

DISCUSSION

In the New Guinea area there are two well-differentiated subspecies of *O. diophthalma* (*virago* and *inseparabilis*) and another (*aruensis*) which inhabits southern New Guinea as well as the Aru Islands. The existence of what appears to be a distinct population in northern New Guinea is a feature of the distribution pattern of the remaining races. The status of this race is uncertain, but it has been assigned to *festetichi.* A darker plumage colouration and larger size distinguish it from the nominate race. On the other hand, differences from *coccineifrons,* the eastern race, are not striking and, if more material were examined, could prove to be inconsistent. An indication of this is the fact that one of the specimens examined appeared to be intermediate in both plumage and size.

In the Huon Peninsula – Astrolabe Bay region of New Guinea the Ramu and Markham Rivers and their tributaries penetrate the mountain ranges by means of deep valleys which tend to separate one massif from another. Such a terrain could disrupt the distribution of a species and provide physical barriers favourable to the establishment of morphologically distinct populations. It is desirable that more material from this region be examined and compared directly with the types of *festetichi* and *coccineifrons.* In my opinion this could result in the synonymizing of these two races, but it seems doubtful that they in turn could be synonymized with *diophthalma* as has been done by Mayr (1941).

Prior to the discovery of *marshalli* on Cape York Peninsula, the relationship between the Australian races of *O. diophthalma* and those from New Guinea does not seem to have been fully appreciated. Rothschild and Hartert (1901) recognised similarities in plumage between the females of *macleayana* and *virago* and, to a lesser degree, between the males of *macleayana* and those of both *virago* and *aruensis.* They treated *macleayana* as a race of *O. diophthalma* but, because of its large size and the almost entirely blue foreheads in both sexes, *coxeni* was considered to be a distinct species. Mathews (1927 and 1946) retained all of the New Guinea forms as races of *O. diophthalma* but gave specific status to *leadbeateri* (= *macleayana*) and *coxeni.*

When commenting on the discovery of *marshalli,* Mayr (1947) remarked that it was to be expected that a population of this species would be found on Cape York, in the distributional gap betweeen the areas inhabited by the New Guinea races and *macleayana*

from northern Queensland. In fact, *marshalli* is exactly what Mayr had suggested it should be—a population connecting the Australian races with those from New Guinea.

Keast (1961) cited *O. diophthalma* in Australia as an example of the speciation process acting on isolated populations. The isolates are confined to the three major tracts of rain forest along the north-eastern coast. As stated by Keast (*loc. cit.*) *coxeni* and *macleayana* are approaching the degree of differentiation typical of species, whereas *marshalli* is probably a recent immigrant. Similar degrees in variation are shown by the insular forms in New Guinea. The race *inseparabilis* inhabits the island farthest away from the mainland and shows nearly as much difference from *coccineifrons* as does *coxeni* from *marshalli* and *aruensis*. The female of *virago* resembles both sexes of *inseparabilis,* while both sexes of *coxeni* show affinities with the male of *macleayana.* In other words the path of migration or colonization is indicated by the areas in which intermediate forms occur. It is true that size differences are shown by *coxeni* and not by *inseparabilis,* but in my opinion these do not warrant the former being singled out as the only race having acquired specific differentiation.

CONCLUSIONS

Specimens of all of the subspecies of the Fig Parrot, *Opopsitta diophthalma,* have been examined and the plumage and size differences noted. Characteristics separating *marshalli* from *aruensis* have been fully described. The races *boweri* and *tweedi* have been synonymized with *macleayana* and *coxeni* respectively, while *festetichi* and *coccineifrons,* hitherto generally synonymized with *diophthalma,* have been accepted pending the acquisition of more material and its subsequent comparison with the types.

It has been shown that both well-differentiated and poorly-differentiated races are found in this species. The former occur as isolates in the New Guinea area as well as in north-eastern Australia. Comparison has been made between the affinities of *coxeni* and *inseparabilis* with the nominate race as indicated by the distribution of intermediate forms. The recognition of *coxeni* as a distinct species has been rejected.

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